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INT CL[5] H04N 7/10 7/18
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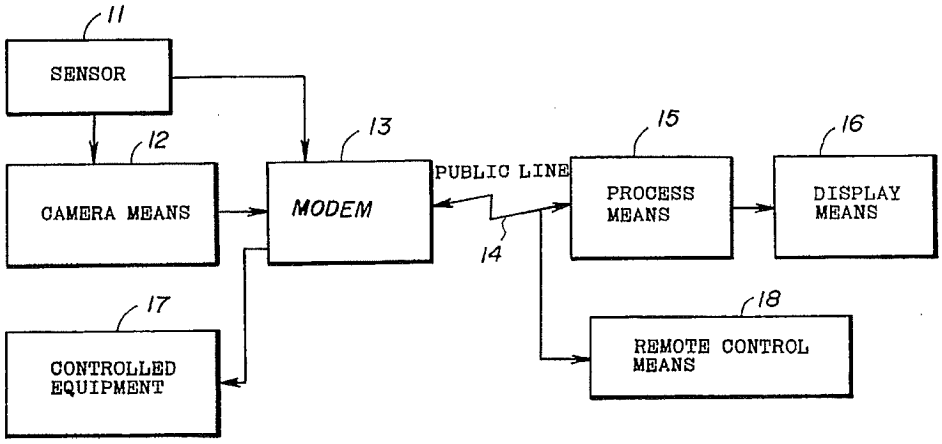
(54) Surveillance system

(57) The surveillance system has a sensor 11, a video camera 12 and a MODEM 13 for transmitting along a telephone line, video signals generated by the camera when the sensor e.g. movement, I-R, noise etc., is activated. The MODEM 13 allows for compression of the video data into the narrower bandwidth telephone cable. A monitoring station for receiving a processing the compressed video signals transmitted along the telephone line, displays the image on a T.V. screen for intruder detection. The modem is also capable of multiplexing a series of video signals from a number of cameras, for transmission along telephone lines.

FIG.3



GB 2 258 579 A

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

FIG. 1

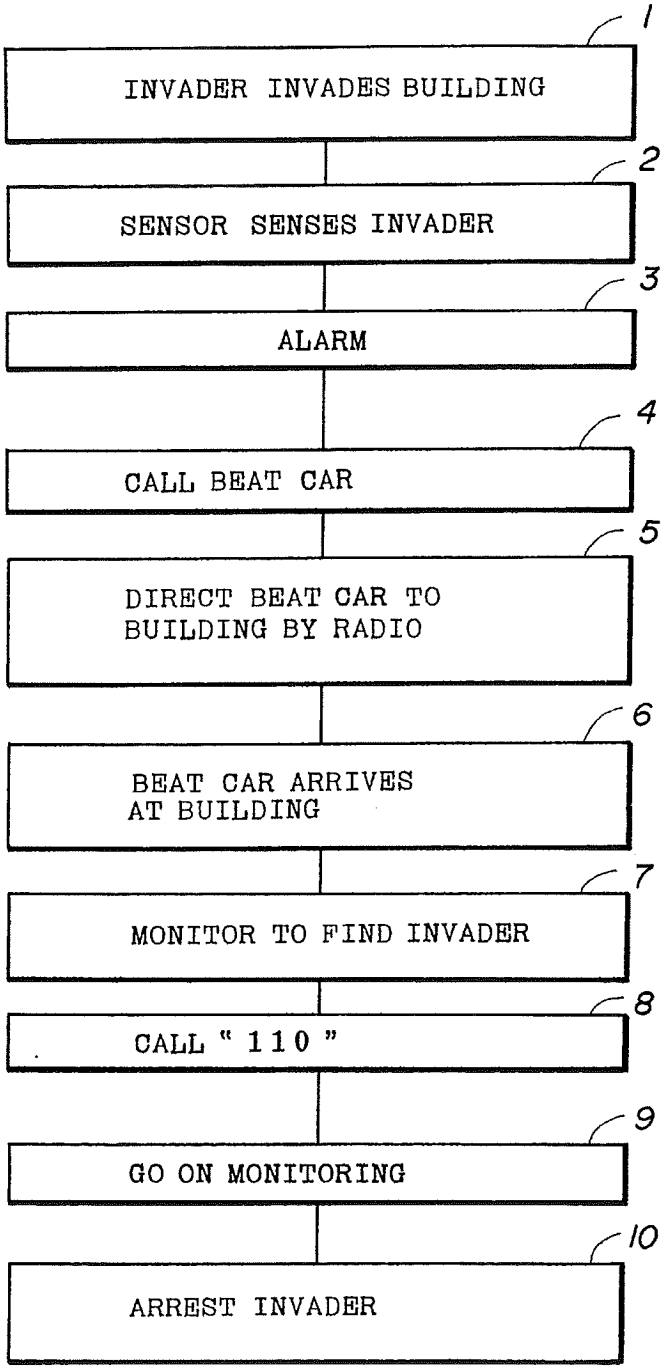

1
INVADER INVADES BUILDING
2
SENSOR SENSES INVADER
3
ALARM
4
CALL BEAT CAR
5
DIRECT BEAT CAR TO BUILDING BY RADIO
6
BEAT CAR ARRIVES AT BUILDING
7
MONITOR TO FIND INVADER
8
CALL " 110 "
9
GO ON MONITORING
10
ARREST INVADER

FIG. 2A

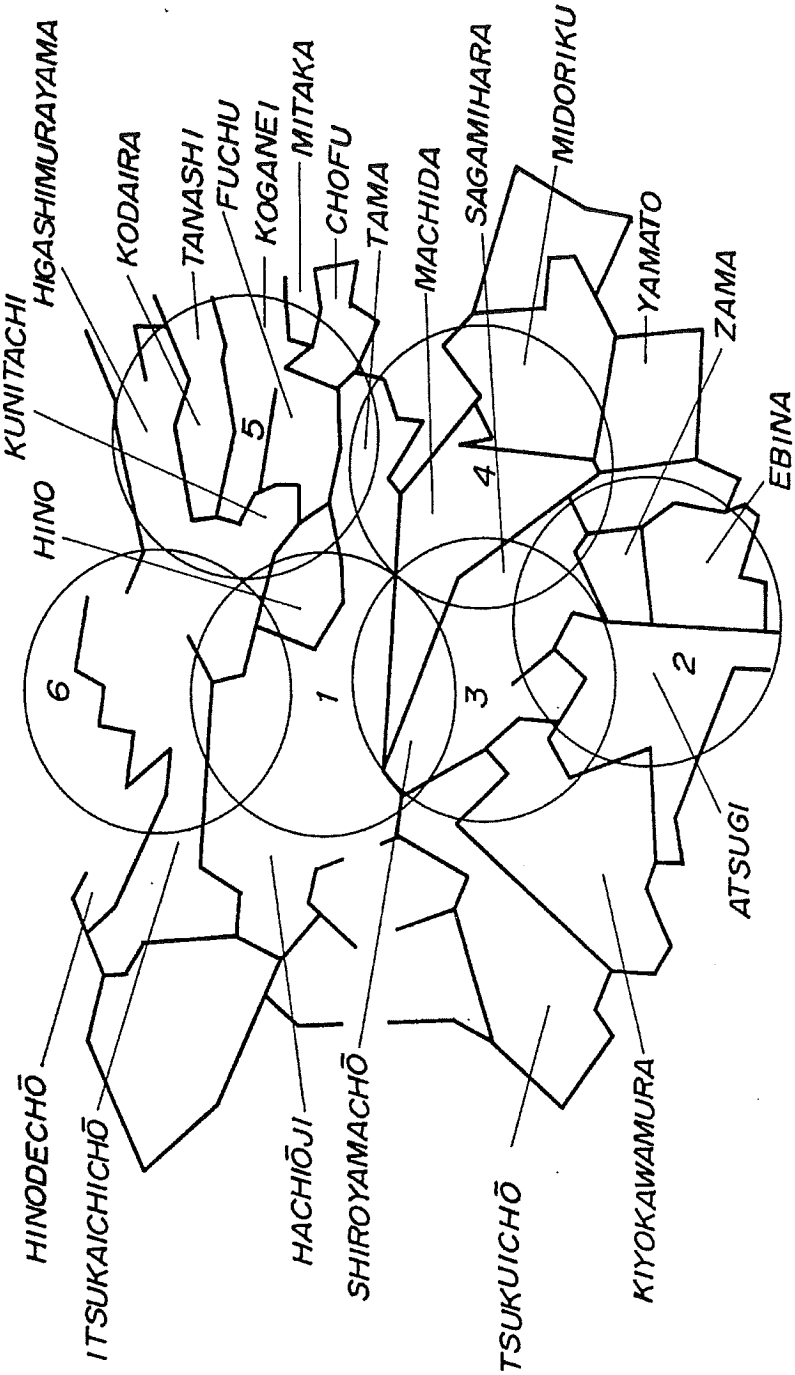

HINODECHŌ
ITSUKAICHICHŌ
HACHIŌJI
SHIROYAMACHŌ
TSUKUICHŌ
KIYOKAWAMURA
ATSUGI
EBINA
ZAMA
YAMATO
MIDORIKU
SAGAMIHARA
MACHIDA
TAMA
CHOFU
MITAKA
KOGANEI
FUCHU
TANASHI
KODAIRA
HIGASHIMURAYAMA
KUNITACHI
HINO
1
2
3
4
5
6

FIG.2B

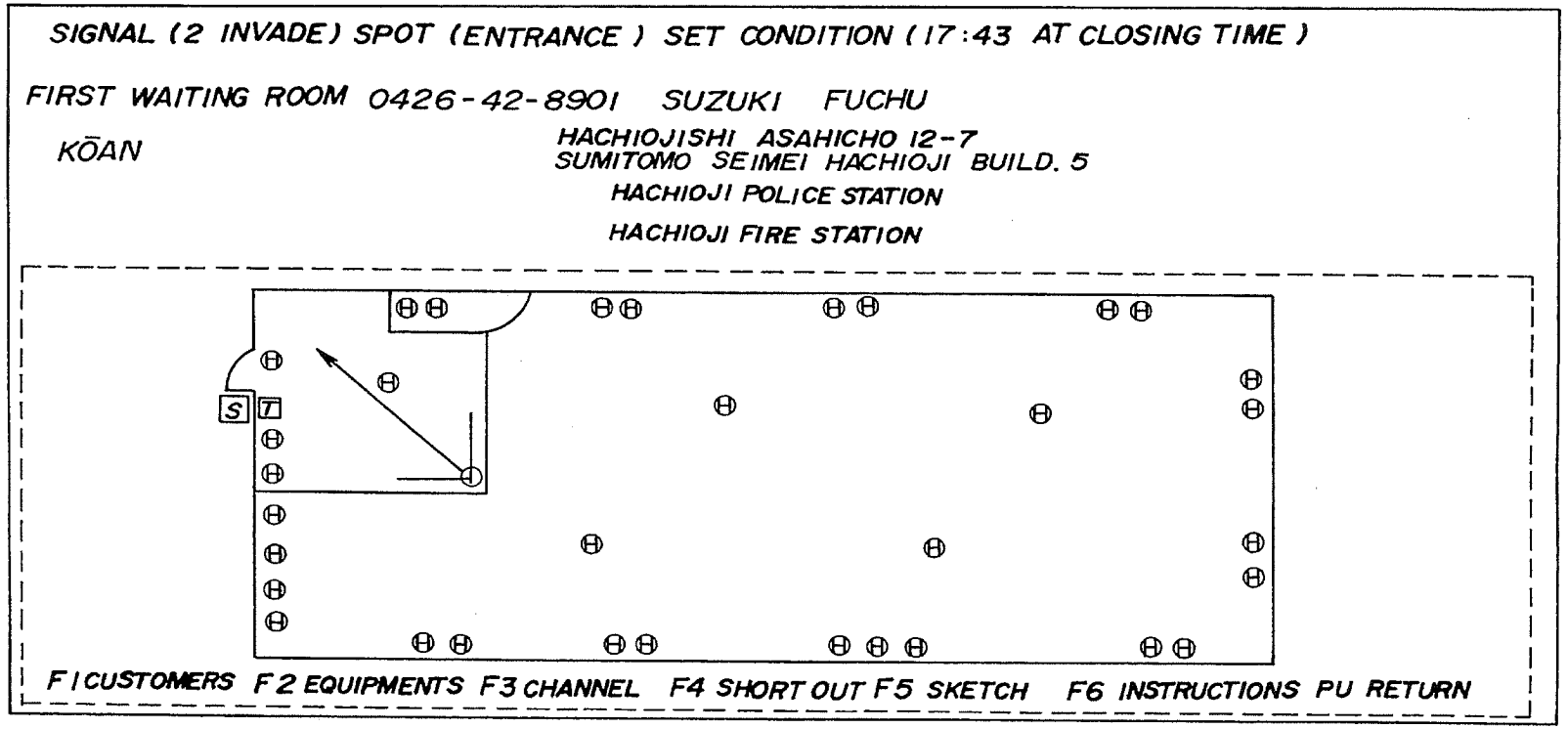

SIGNAL (2 INVADE) SPOT (ENTRANCE) SET CONDITION (17:43 AT CLOSING TIME)
FIRST WAITING ROOM 0426-42-8901 SUZUKI FUCHU
KŌAN
HACHIOJISHI ASAHICHO 12-7
SUMITOMO SEIMEI HACHIOJI BUILD. 5
HACHIOJI POLICE STATION
HACHIOJI FIRE STATION
S
T
F1 CUSTOMERS F2 EQUIPMENTS F3 CHANNEL F4 SHORT OUT F5 SKETCH F6 INSTRUCTIONS PU RETURN

FIG. 2C

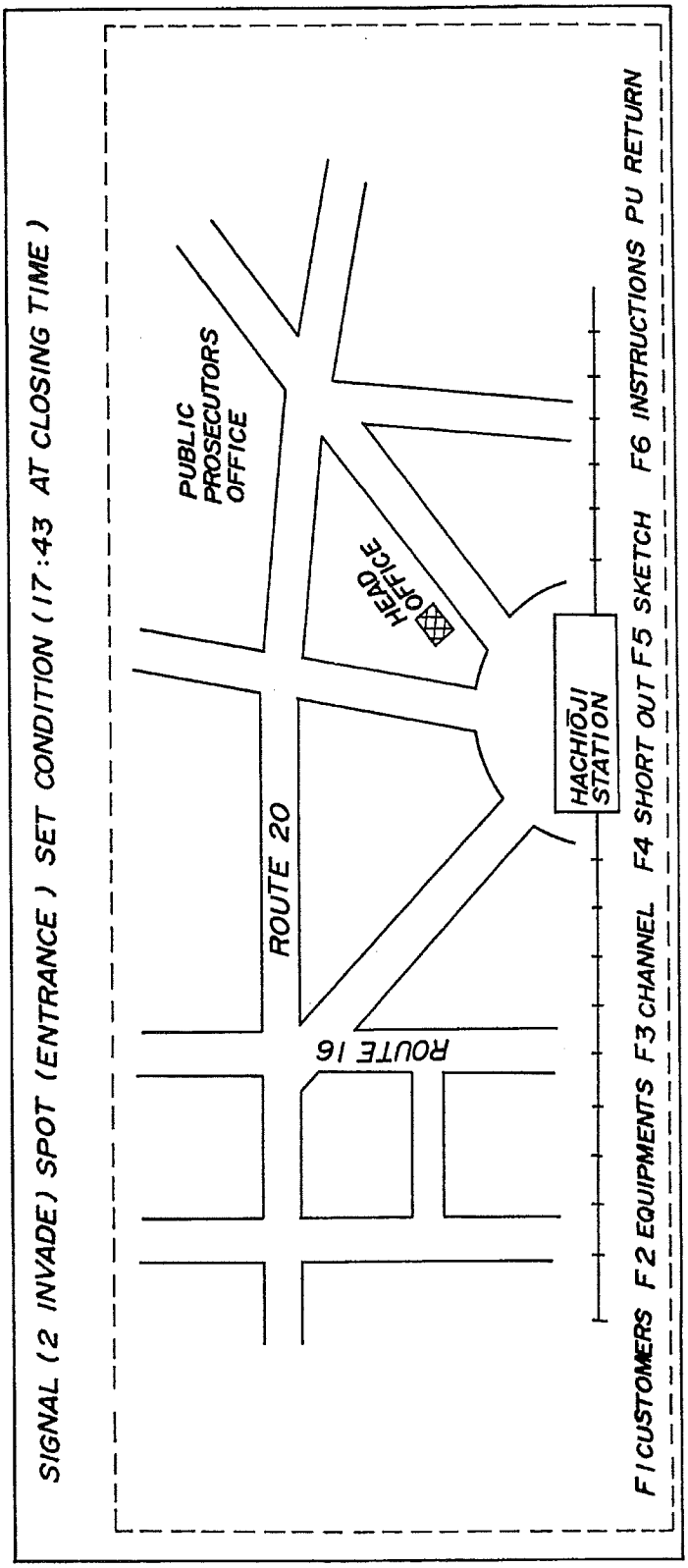

SIGNAL (2 INVADE) SPOT (ENTRANCE) SET CONDITION (17:43 AT CLOSING TIME)
PUBLIC PROSECUTORS OFFICE
HEAD OFFICE
ROUTE 20
ROUTE 16
HACHIŌJI STATION
F1 CUSTOMERS F2 EQUIPMENTS F3 CHANNEL F4 SHORT OUT F5 SKETCH F6 INSTRUCTIONS PU RETURN

FIG. 2D

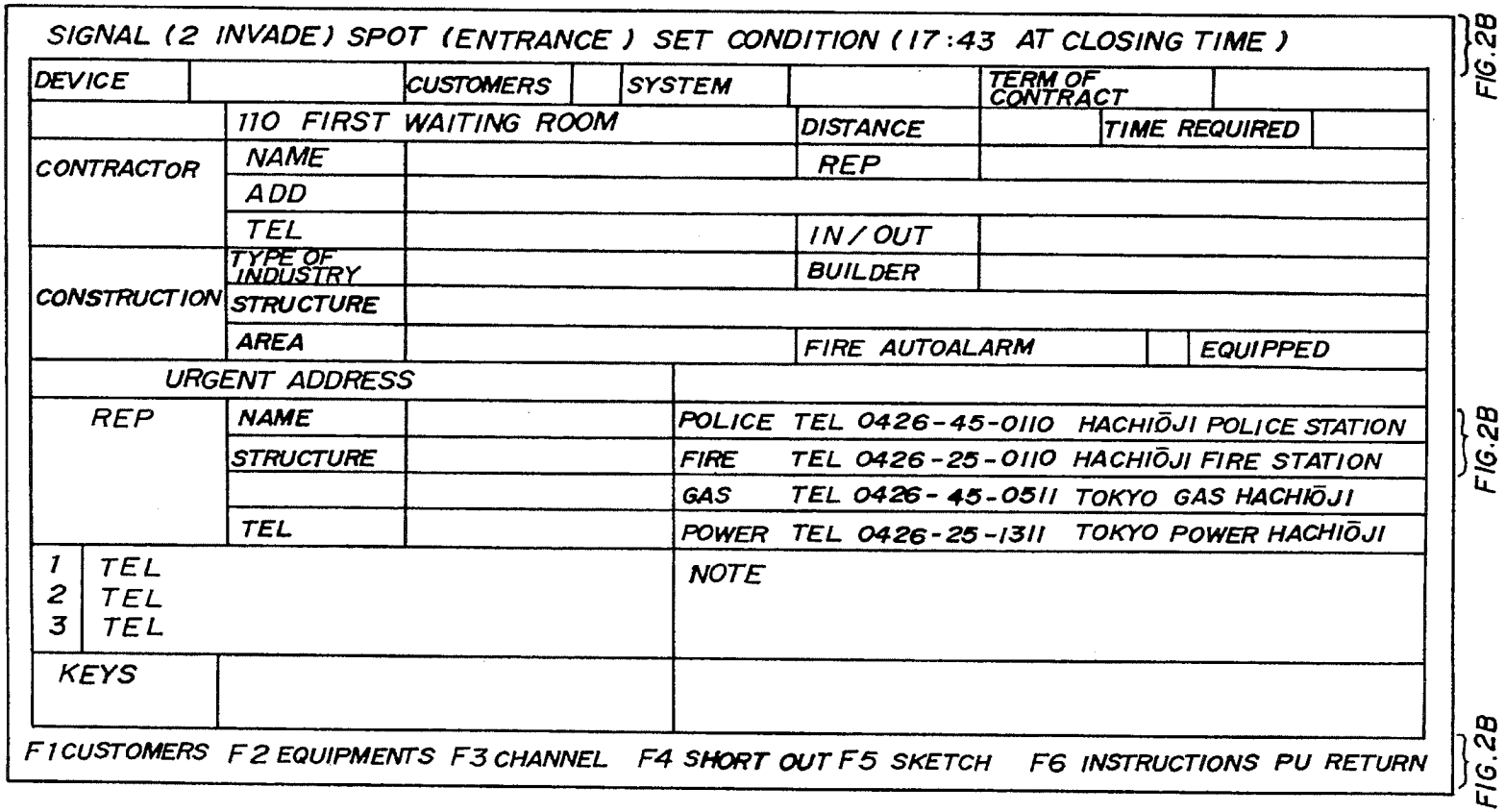

SIGNAL (2 INVADE) SPOT (ENTRANCE) SET CONDITION (17:43 AT CLOSING TIME)
DEVICE
CUSTOMERS
SYSTEM
TERM OF CONTRACT
110 FIRST WAITING ROOM
DISTANCE
TIME REQUIRED
CONTRACTOR
NAME
REP
ADD
TEL
IN / OUT
CONSTRUCTION
TYPE OF INDUSTRY
BUILDER
STRUCTURE
AREA
FIRE AUTOALARM
EQUIPPED
URGENT ADDRESS
REP
NAME
STRUCTURE
TEL
POLICE TEL 0426-45-0110 HACHIŌJI POLICE STATION
FIRE TEL 0426-25-0110 HACHIŌJI FIRE STATION
GAS TEL 0426-45-0511 TOKYO GAS HACHIŌJI
POWER TEL 0426-25-1311 TOKYO POWER HACHIŌJI
1 TEL
2 TEL
3 TEL
NOTE
KEYS
F1 CUSTOMERS F2 EQUIPMENTS F3 CHANNEL F4 SHORT OUT F5 SKETCH F6 INSTRUCTIONS PU RETURN
FIG. 2B
FIG. 2B
FIG. 2B

FIG.3

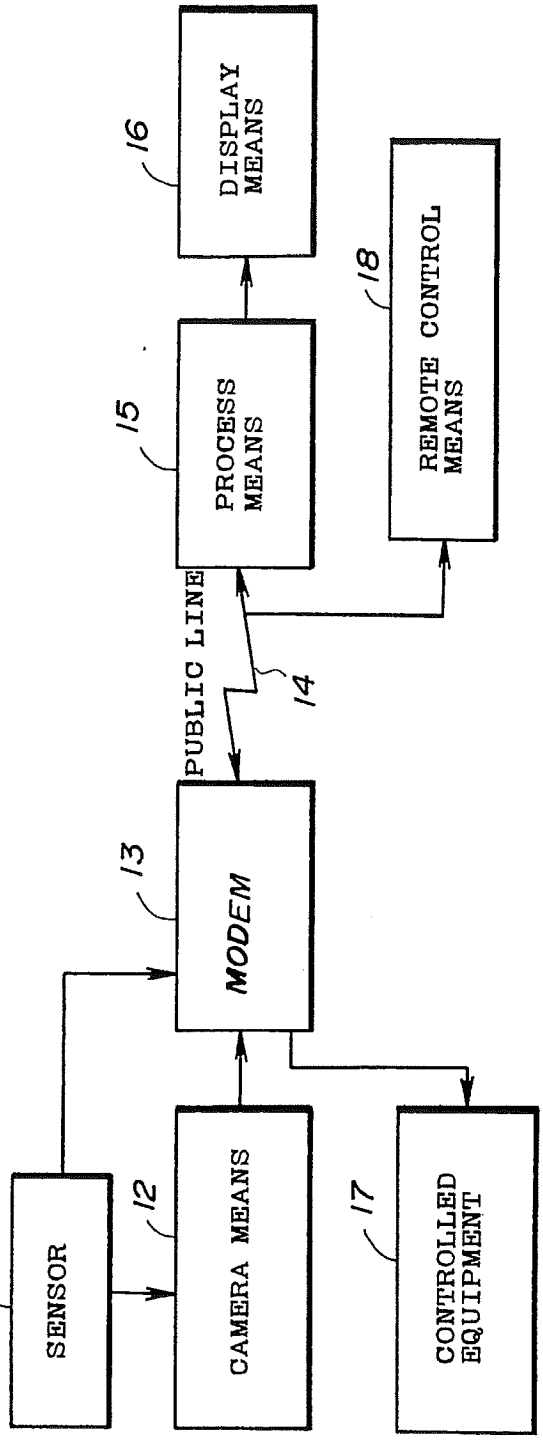

SENSOR
11
CAMERA MEANS
12
MODEM
13
PUBLIC LINE
14
PROCESS MEANS
15
DISPLAY MEANS
16
CONTROLLED EQUIPMENT
17
REMOTE CONTROL MEANS
18

FIG.4

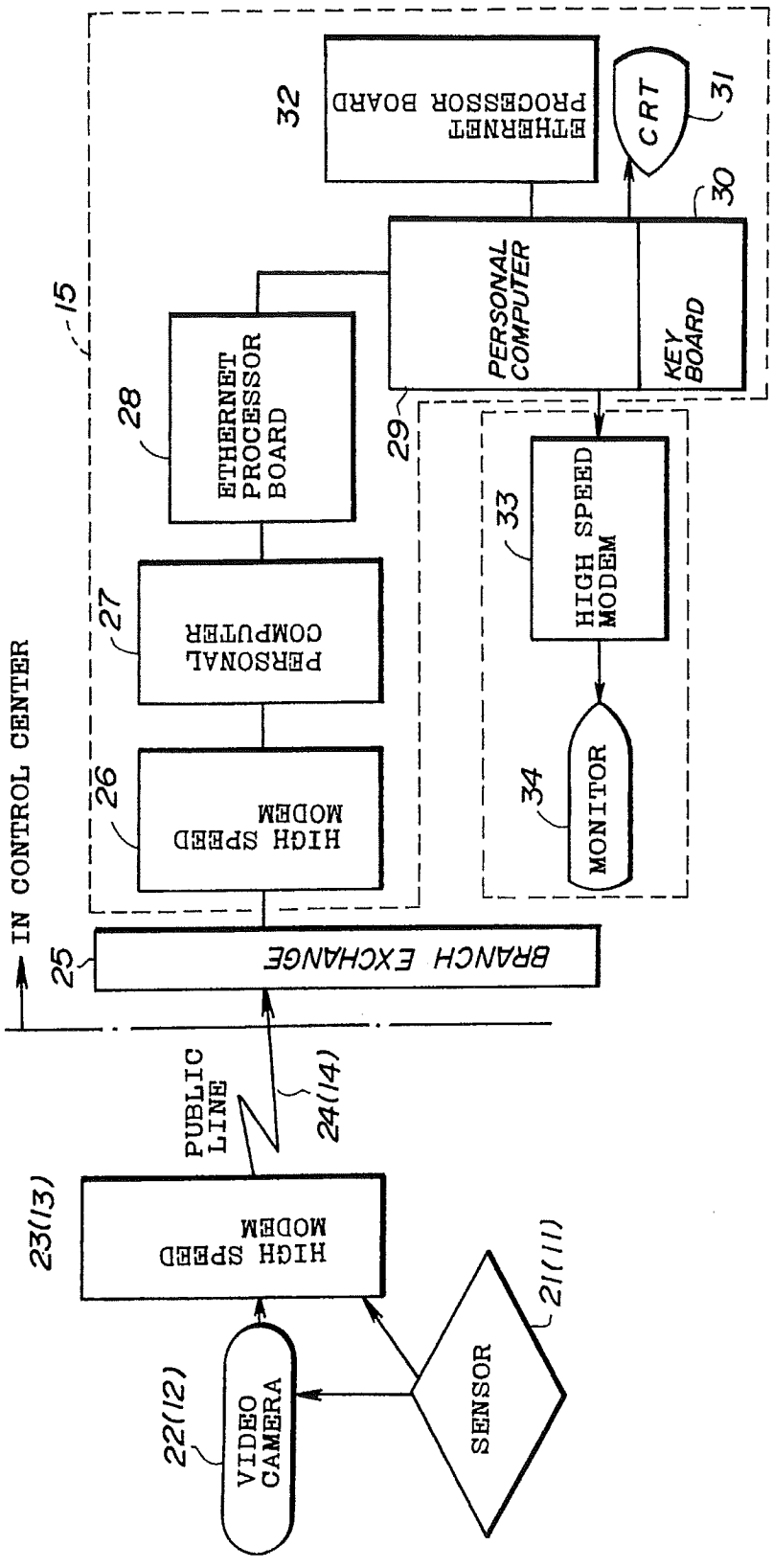
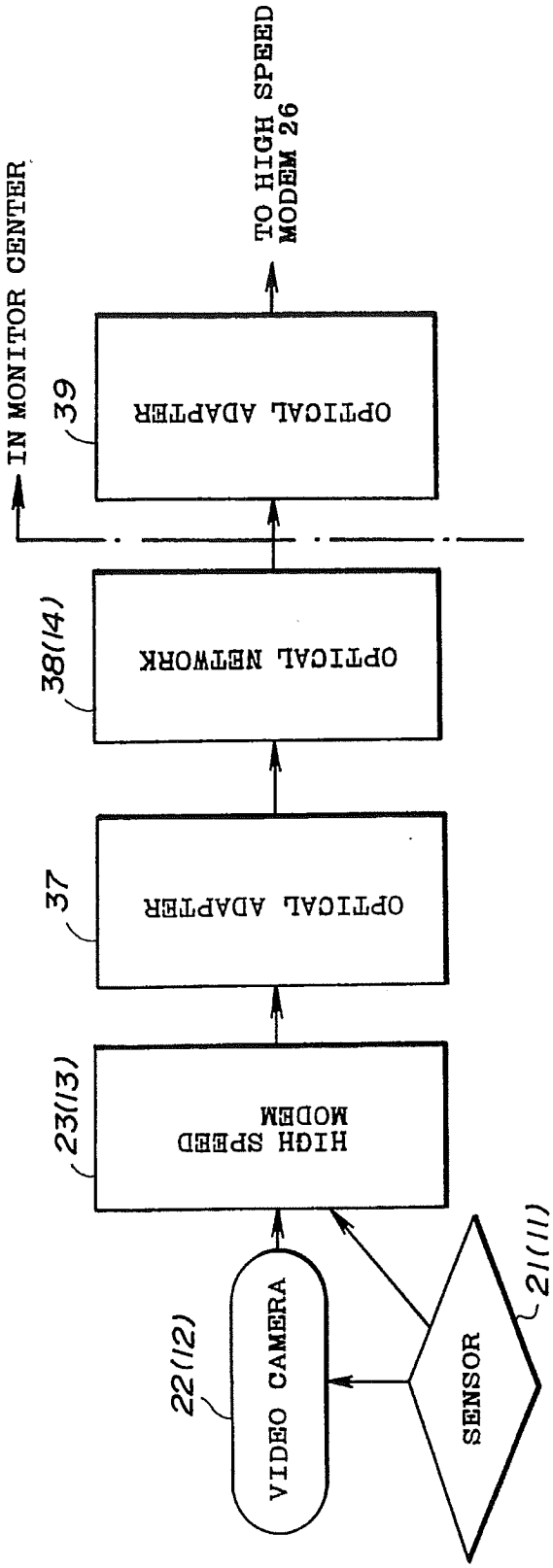

IN CONTROL CENTER
15
25
BRANCH EXCHANGE
PUBLIC LINE
24(14)
23(13)
HIGH SPEED MODEM
22(12)
VIDEO CAMERA
21(11)
SENSOR
26
HIGH SPEED MODEM
27
PERSONAL COMPUTER
28
ETHERNET PROCESSOR BOARD
29
30
PERSONAL COMPUTER
KEY BOARD
31
CRT
32
ETHERNET PROCESSOR BOARD
33
HIGH SPEED MODEM
34
MONITOR

FIG.5


TO HIGH SPEED MODEM 26
IN MONITOR CENTER
39
OPTICAL ADAPTER
38(14)
OPTICAL NETWORK
37
OPTICAL ADAPTER
23(13)
HIGH SPEED MODEM
22(12)
VIDEO CAMERA
21(11)
SENSOR

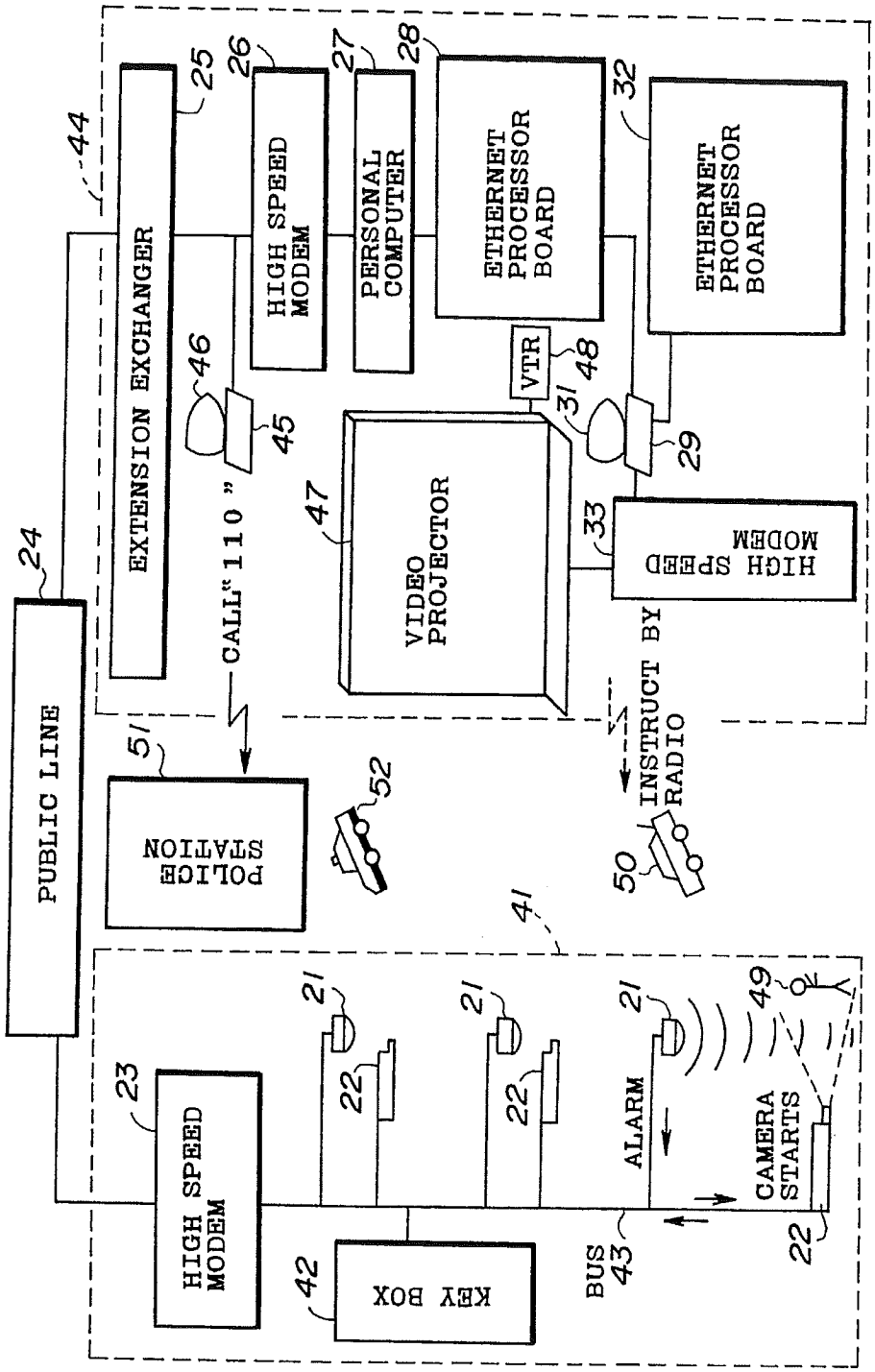
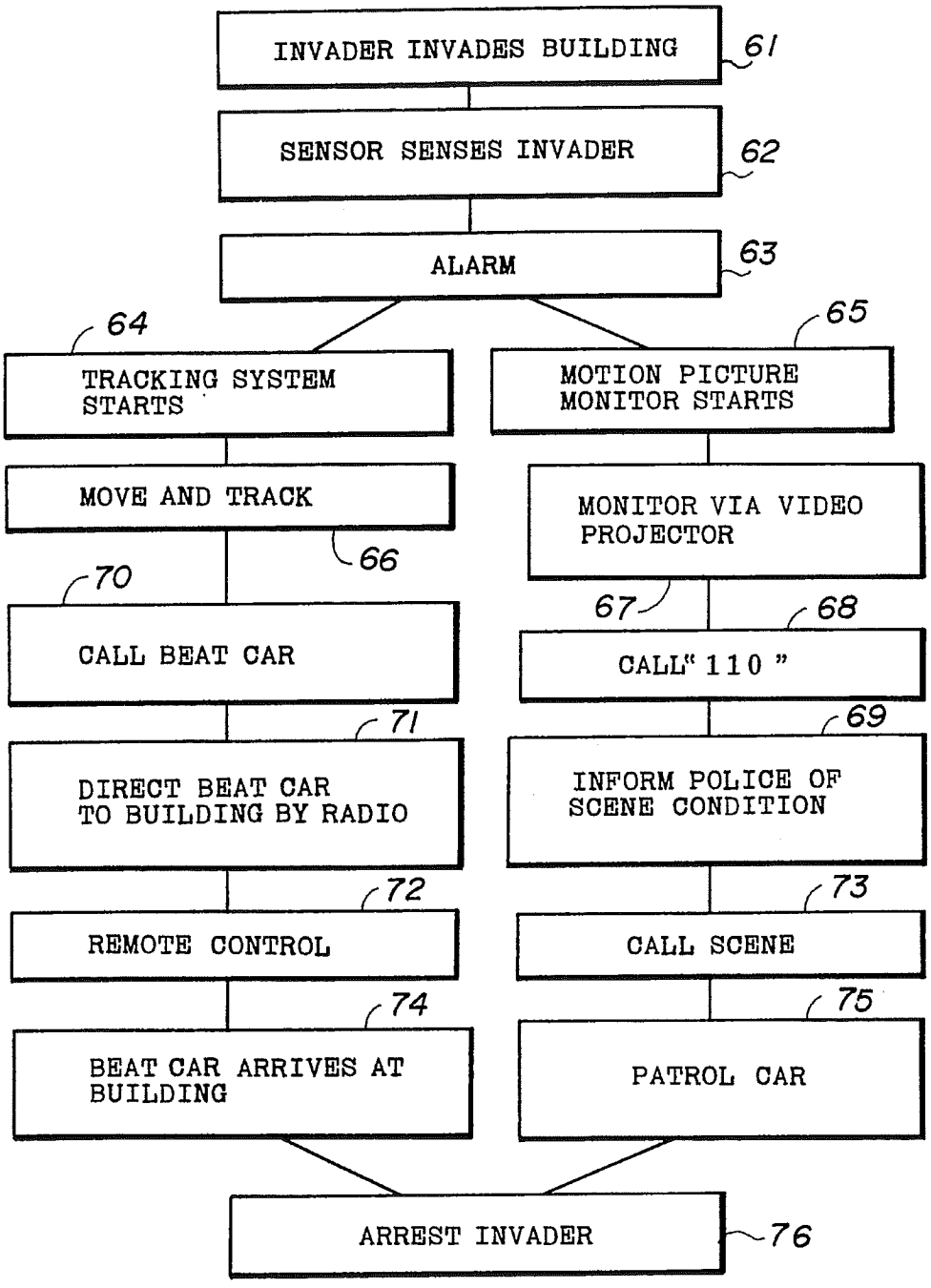

PUBLIC LINE
24
EXTENSION EXCHANGER
25
HIGH SPEED MODEM
26
PERSONAL COMPUTER
27
ETHERNET PROCESSOR BOARD
28
ETHERNET PROCESSOR BOARD
32
44
CALL "110"
46
45
VTR
48
31
29
47
VIDEO PROJECTOR
33
HIGH SPEED MODEM
INSTRUCT BY RADIO
50
51
POLICE STATION
52
41
HIGH SPEED MODEM
23
21
22
21
22
21
ALARM
49
CAMERA STARTS
22
BUS
43
KEY BOX
42

FIG.6

FIG.7


INVADER INVADES BUILDING
61
SENSOR SENSES INVADER
62
ALARM
63
64
TRACKING SYSTEM STARTS
65
MOTION PICTURE MONITOR STARTS
MOVE AND TRACK
66
MONITOR VIA VIDEO PROJECTOR
70
CALL BEAT CAR
67
68
CALL" 110 "
71
DIRECT BEAT CAR TO BUILDING BY RADIO
69
INFORM POLICE OF SCENE CONDITION
72
REMOTE CONTROL
73
CALL SCENE
74
BEAT CAR ARRIVES AT BUILDING
75
PATROL CAR
ARREST INVADER
76

MONITORING SYSTEM WHICH MONITORS OBJECT VIA PUBLIC LINE

The present invention relates generally to monitoring systems, and more particularly to a monitoring system which monitors information relating to buildings from guarded data to administration data transmitted via a public line, such as a telephone line, an integrated services digital network (ISDN), and so on.

A conventional guarding system comprises a plurality of sensors located in a monitored building, a display in a control center of a guarding security company, and a leased line which connects the monitored building with the control center. According to the guarding system, as shown in FIG.1, when an invader invades the monitored building (in step 1), one of the sensors senses him/her (in step 2) and alarms the control center (in step 3). In response to the alarm, the display in the control center displays the guarding charge area with a sensor, as enclosed by circles in FIG.2A. Incidentally, by pushing a desired function key, the display selectively displays one of a guarding building sensor arrangement shown in FIG.2B which shows in plan a layout of the building and an arrangement of the sensors, a guarding building short cut map shown in FIG.2C, or a guarding building registered data shown in FIG.2D. The control center calls a beat car based on the data from the display (in step 4), and directs it to the scene by radio (in step 5). When the beat car arrives at the building (in step 6) and a guard finds the invader (in step 7), the guard calls "110" (in step 8) and goes on monitoring the invader (in step 9). After the patrol car arrives there, the guard cooperates with the police to arrest the invader (in step 10).

On the other hand, the information network system

(INS) which has a plurality of sensors and camera means is known. According to the INS, since the camera means transmits motion picture data of the monitored object to the control center in response to the sensing of a sensor, the monitored object can be identified.

However, the former conventional guarding system has the following disadvantages:

1. A conventional sensor senses an animal or a garbage bin crossing in front thereof, even if it is not an invader. Therefore, even if the sensor senses something, the control center cannot identify whether or not it is an invader, so that the guard often rushes unnecessarily to the scene.

2. Since it takes relatively long time to call "110" after the sensor alarms the control center, a quick calling of "110" cannot be achieved.

3. A leased line provided between the control center and the monitored building is expensive.

On the other hand, the latter conventional guarding system has also a disadvantage in that the leased line is very expensive.

Accordingly, it is a general object of the present invention to provide a novel and useful monitoring system in which the above disadvantages are eliminated.

Another object of the present invention is to provide a relatively inexpensive monitoring system which can quickly and definitely identify a monitored object.

The more specific object of the present invention is to provide a monitoring system which comprises a sensor which outputs a predetermined output signal when the sensor senses a monitored object, camera means, coupled to the sensor, for videoing the monitored object, sensed by the sensor, as a motion picture, data compressing means,

coupled to the camera means and a public line, for converting first data representing the motion picture picked by the camera means into second data which can be be transmitted via the public line by means of compressing the first data, processing means, coupled to the public line, for converting the second data into the first data, and display means, coupled to the processing means, for displaying the second data converted by the processing means as the motion picture, the monitored object being monitored via the display means.

According to the present invention, since the display means displays a motion picture of the monitored object, the monitored object can be identified quickly and definitely. In addition, since the public line is used, a monitoring system less expensive than the monitoring system using a leased line can be proposed.

Other objects and further features of the present invention will become apparent from the detailed description when read in conjunction with the accompanying drawings.

FIG.1 shows a flowchart for explaining an operation of the conventional guarding system;

FIG.2 shows views for explaining functions of a display used for the guarding system shown in FIG.1;

FIG.3 shows a principle block diagram of a monitoring system according to the present invention;

FIG.4 shows a principle block diagram of a monitoring system of the first embodiment according to the present invention;

FIG.5 shows a principle block diagram of a monitoring system of the second embodiment according to the present invention;

FIG.6 shows a block diagram according to the

present invention which is used for the guarding system; and

FIG.7 shows a flowchart for explaining an operation of the guarding system shown in FIG.6.

The monitoring system according to the present invention comprises, as shown in FIG.3, a sensor 11, camera means 12, a MODEM 13, processing means 15, display means 16, a controlled equipment 17 and remote control means 18. Incidentally, whether or not the controlled equipment 17 and remote control means 18 are provided is a matter of choice. The sensor 11, the camera means 12, the MODEM 13 and the controlled equipment 17 are respectively provided for the monitoring building. The processing means 15, the display means 16 and the remote control means 18 are respectively provided for the control center. The sensor 11 is connected to the camera means 12 and the MODEM 13, respectively. The camera means 12 is connected to the MODEM 13 and the controlled equipment 17, respectively. The MODEM 13 is connected to the processing means 15 and the remote control means 18 via the public line 14. The processing means is connected to the display means 16.

The sensor 11 outputs an output signal to the camera means 12 and the MODEM 13 when it senses a monitored object.

The camera means 12 videos an motion picture of the monitored object and generates an motion picture signal in response to the output signal from the sensor 11.

The MODEM 13 compresses the motion picture signal generated from the camera means 12 so that the motion picture signal can be transmitted via the public line 14. The MODEM 13 compresses the signal by means of omitting the duplicate transmission of same images, for example. The MODEM 13 also compresses the output signal from the sensor 11 so that the signal can be transmitted via the public

line 14.

The public line 14 comprises a telephone line or the ISDN. The public line 14 may be comprised of a metal cable or an optical cable.

The processing means 15 restores the original motion picture signal from the compressed motion picture signal transmitted via the public line 14.

The display means 16 displays one of the function screens shown in FIGs.2A to 2D based on the output signal from the sensor 11 and displays a motion picture based on the original motion picture signal. Incidentally, the monitoring system may start after the output signal from the sensor 11 is supplied to the display means 16.

The controlled equipment 17, provided in the vicinity of the sensor 11 and the camera means 12, comprises a door lock mechanism, speakers and lighting mechanism of the monitored building.

The remote control means 18 remote-controls the controlled equipment 17 in response to the sensing of the sensor 11. For example, the remote control means 18 locks all the doors in the monitored building by controlling the door lock mechanism, threaten an invader with a voice message by controlling the speakers, and turns on/off predetermined lights by controlling the lighting mechanism.

Next, a description will now be given of the operation of the monitoring system according to the present invention. First, the sensor 11 senses the monitored object and outputs the output signal to the camera means 12 and the MODEM 13. The camera means 12 videos the motion picture of the monitored object in response to the output signal. After the motion picture is videoed, the camera means 12 outputs the motion picture signal to the MODEM 13. The MODEM 13 transmits output signal from the sensor

11 and the motion picture signal from the camera means 12 to the processing means 15 via the public line 14 by means of compressing these signals. The processing means 15 restores the compressed signal to the original signal and outputs it to the display means 16. The display means 16 displays one of the function screens shown in FIGs.2A to 2D, and displays the motion picture of the monitored object based on the motion picture signal. Thus, the operator of the display means 16 can properly monitor the monitored object in real time and, if necessary, remote-control the controlled equipment 17 via the remote control means 18.

The monitoring system of the first embodiment according to the present invention comprises, as shown in FIG.4, a sensor 21, a video camera 22, a high speed MODEM 23, a branch exchange 25, the processing means 15 and the display means 16. Incidentally, those elements which are the same as corresponding elements in FIG.3 are designated by the same reference numerals, and a description thereof will be omitted. The sensor 21 corresponds to the sensor 11, the video camera 22 corresponds to the camera means 12, and the high speed MODEM 23 corresponds to the MODEM 13, respectively. The sensor 21 is connected to the video camera 22 and the high speed MODEM 23, respectively. The video camera 22 is connected to the high speed MODEM 23. The sensor 21, the video camera 22 and the high speed MODEM 23 are respectively provided in the monitored building. The branch exchange 25, processing means 15 and the display means 16 are respectively provided in the control center. The high speed MODEM 23 and the branch exchange 25 are connected with each other via the public line 24. The branch exchange 25 is connected to the processing means 15, and the processing means is connected to the display means 16.

The sensor 21 may be comprised of a heat sensor, a magnetic sensor, an infrared sensor, and an ultrasonic sensor which respectively sense a monitored object. The sensor 21 outputs the output signal to the high speed MODEM 23 via a transmitter (not shown) when it senses the monitored object. A plurality of sensors 21 are usually provided for the monitored building.

The video camera 22 videos the monitored object in response to the output signal from the sensor 21, and outputs a video signal to the high speed MODEM 23. A plurality of video cameras 22 may be provided so as to correspond to the plurality of sensors 21, or one video camera may be commonly used for the plurality of sensors 21. Usually, among the plurality of video cameras 22, the video camera 22, which corresponds to the sensor 21 which senses the monitored object last among the plurality of sensors, outputs the video signal. However, video signals may be output in response to output signals simultaneously output from more than two sensors 21. In this case, the video signals corresponding to the respective sensors are output in parallel. Incidentally, the video camera 22 may be a visible light television camera or an infrared camera.

The high speed MODEM 23 is based on the V.42 bis specified by Comité Consultatif International Télégraphique et Téléphonique (CCITT). The V.32 bis concerning a double MODEMs with 9600 bps for performing a data transmission connected to a public line in a voice band is known. The 42 bis which has an error correcting function during a data transmission so that an error in transmitted data caused by noises generated at the public line is automatically corrected. The V.42 bis is designed to speed up the data transmission. The transmitted data includes an error correcting function and a data compression function. The

data transmission speed of 38400 bps can be obtained on through the public line by means of the data compression. The high speed MODEM 23 converts the video signal from the video camera 22 and the output signal from the sensor 21 into the digital data and transmits it to the branch exchange 25 via the public line 24. The high speed MODEM 23 is commonly used for a plurality of sensors 21 and video cameras 22. Therefore, the digital data corresponding to the number of the video cameras 22 is sequentially and time-divisionally output from the high speed MODEM 23.

In this embodiment, metal cables are used for the public line 24. Incidentally, the public line 24 may comprises a telephone line or an ISDN line. The public line 24 has a basic charge of 2700 yen or 5400 yen while a leased line has a basic charge of 79000 yen to several million yen.

The processing means 15 comprises a high speed MODEM 26, personal computers 26 and 29, Ethernet processor boards 28 and 32, a key board 30, and a cathode-ray tube (CRT) 31. The high speed MODEM 26 is connected to the branch exchange 25 and the personal computer 27. The personal computer 27 is connected to the Ethernet processor board 28. The personal computer 29 is connected to the key board 30, the CRT 31, the Ethernet processor board 32 and the display means 16.

The branch exchange 25 connects one of subscriber lines respectively connected to monitored buildings to the control center.

The high speed MODEM 26, based on the V.42 specified by the CCITT, converts the compressed digital data into the original data, which may be based on a V.21 specified by the CCITT.

The personal computer 27 has an interface which

converts the digital data into a data in accordance with a protocol determined by the Ethernet.

The Ethernet processor board 28 time-divisionally processes the digital data transmitted from the personal computer 27 via one of bus-like transmission paths. The Ethernet processor board 28, used for Local Area Network (LAN), is a communication board having Ethernet firmware therein. The Ethernet processor board outputs the digital data to the personal computer 29 via, for example, an IEEE 802.3 standard coaxial cable.

The personal computer 29 has a hard disk therein and the key board 30. Characters input from the key board is displayed on the CRT 31. The CRT 31 outputs one of the function screens shown in FIGs.2A to 2D in response to the output signal from the sensor 21. Incidentally, the CRT may be included in the display means 16. The personal computer 29 has an interface which converts the digital data of X.21 specified by the CCITT into the data having a protocol determined by the Ethernet.

The display means 16 comprises a high speed MODEM 33 and a monitor 34. The high speed MODEM 33 is connected to the personal computer 29 of the processing means 15 and the monitor 34. The high speed MODEM 33 is based on the V.42 bis specified by the CCITT, and converts the digital data into the analog data by means of the digital-to-analog conversion, so that the high speed MODEM 33 outputs the video data to the monitor 34. The monitor 34 displays an motion picture corresponding to the video signal output from the high speed MODEM 33.

Incidentally, as shown in FIG.5, an optical network 34 may be used for the public line 14. The monitoring system of the second embodiment according to the present invention comprises, as shown in FIG.5, optical

adapters 37 and 38. The video signal from video camera 22 and the output signal from the sensor 21 are respectively supplied to the high speed MODEM 23 to be converted into the digital data, and output to the optical adapter 37. The optical adapter 37 converts the digital data into an optical data corresponding to an I interface given by the CCITT, and outputs to the optical adapter 39 via the optical net 38. The optical net 38 may comprise an INS network 64 including two data channels (B-channels) having 64 kbps and one signal channel (D-channel) having 16 kbps. The optical adapter 39 converts the optical data corresponding to the I interface into the data of X.21 given by the CCITT, and outputs the high speed MODEM 26 shown in FIG.4.

Incidentally, both metal cables and optical net may be used for the public line 14. Since both metal cables and optical net achieve a bi-directional transmission, the operator of the display means 16 can perform remote controlling by transmitting data to the monitored building.

The monitoring system according to the present invention can be applied to the building administration, such as water administration, EV checking, automatic detection system, and in/out administration. In addition, the present invention can be applied to the guarding system shown in FIG.6. Incidentally, those elements in FIG.6 which are the same as corresponding elements in FIG.4 are designated by the same reference numerals, and a description thereof will be omitted. Numeral 41 denotes a monitored building in which a plurality of sensors 21 and corresponding video cameras 22 are provided for predetermined rooms. Numeral 42 denotes a key box in/from which an ID card is inserted/ejected. Each of output

terminals of the sensors 21, the video cameras 22 and the key box 42 is connected to the high speed MODEM 23 via a corresponding bus 43. On the other hand, numeral 44 denotes a guarding security company having a control center which is similar to that shown in FIG.4 but however further comprises a personal computer 45, CRT 46, video projector 47 and VTR 48.

Next, a description will now be given of the operation of the guarding system with reference to FIGs.6 and 7. First, after the last person which leaves from the building 41 inserts his/her ID card into the key box 42, information of the ID card is read out by the key box 42 and is transmitted to the personal computer 29 in the guard security company 44. If the ID card has been registered, the guarding system is set by the instruction of the personal computer 29. Consequently, an output signal from a sensor 21 is output to the high speed modem 23 and the video camera 22 via the transmitter (not shown).

If an invader 49 invades the building 41 (in step 61) and one of the sensors 21 senses the invader 49 (in step 62), the output signal as an alarm is supplied from the sensor 21 to the personal computer 45 via the corresponding bus 43, high speed MODEM 23, public line 24 and branch exchange 25. As a result, the guarding system starts (in step 63). That is, in response to the output signal from the sensor 21, the video camera 22 videos the invader 49 and the tracking system starts (in step 64). The video signal from the video camera 22 is supplied to the personal computer 29 via the high speed MODEM 26 and personal computer 27, Ethernet processor board 28. Thus, the operator in the control center can monitor the motion picture of the invader 49 (in step 65).

Based on the output signal from the sensor 21,

the operator turns on lights (not shown) in the vicinity of the invader 49 via the personal computer 45, public line 24, high speed MODEM 23, etc, and manipulates the corresponding video camera 22. In addition, the operator records the activity of the invader 49 as a perpetuation of evidence in the VTR. The operator manipulates the personal computer 45 to selectively indicate a desired function screen, as shown in FIGs.2A to 2D. The operator manipulates the corresponding video camera 22 in accordance with the movements of the invader 49 based on a flashing point representing the sensor 21 on the guarding building sensor arrangement shown in FIG.2B (in step 66). Since the motion picture of the invader 49 videoed by the video camera 22 is indicated on the video projector 47, the operator can easily find the presence of the invader 49. Thus, the operator calls "110" to the police station 51 while he/she is monitoring the scene (in steps 67 to 69). When the operator calls "100", a patrol car 52 rushes to the scene. On the other hand, the control center calls a beat car 50, as is the same in the conventional art, and directs the beat car 50 to rush the scene by radio (in steps 70 and 71).

Since the movement of the invader 49 is displayed in real time, the operator in the control center can precisely grasp him/her. Therefore, if necessary, the operator may lock all the doors in the building (in step 72), and menace the invader 49 by voice (in step 73) by remote control. Lastly, the beat car 50 and the patrol car 52 respectively arrive at the scene (in steps 74 and 75) to arrest the invader 49 (in step 76).

In this embodiment, since the personal computer 29 serves as a processing means and the remote control means 18, the setting on/off of each sensor 21 may be

performed by remote control. Therefore, a guard does not have to go to a building even when, for example, someone goes to th building during the night or goods are shipped and/or received during the night. In this case, only if a person who goes to the building inserts a correct ID card into the key box 42, will the operator release the locking of doors and setting of the sensors 21 by remote control. Incidentally, the reason why the setting of the sensors 21 is released is that it is not necessary to guard the building 41 when people are there and, in addition, it is necessary to prevent the sensors 21 from unnecessarily and frequently sensing people.

As mentioned above, according to the present invention, since the invader 49 can be definitely identified in an motion picture, a vague report never occurs. In addition, a quick call "110" can be achieved and a highly reliable guarding system can be presented. Moreover, a running cost can be decreased almost 1/10 to 1/15 in comparison with a case where a leased line is used. Furthermore, a guard does not have to wastefully rush to the scene because of the remote control.

Further, the present invention is not limited to these preferred embodiments, but various variations and modifications may be made without departing from the scope of the present invention.

WHAT WE CLAIM IS:

1. A monitoring system comprising:

a sensor which outputs a predetermined output signal when said sensor senses a monitored object;

camera means, coupled to said sensor, for videoing the monitored object sensed by said sensor as a motion picture;

data compressing means, coupled to said camera means and a public line, for converting first data representing the motion picture videoed by said camera means into second data which can be be transmitted via the public line by means of compressing the first data;

processing means, coupled to the public line, for converting the second data into the first data; and

display means, coupled to said processing means, for displaying the second data converted by said processing means as the motion picture, the monitored object being monitored via said display means.

2. A monitoring system according to Claim 1 wherein said data compressing means is coupled to said sensor, said data compressing means outputting the predetermined output signal output from said sensor via the public line and said processing means by means of compressing the predetermined output signal, and said camera means operating when the predetermined output signal is input to said display means.

3. A monitoring system according to Claim 1, wherein the public line comprises a telephone line.

4. A monitoring system according to Claim 1,

wherein the public line comprises an integrated services digital network (ISDN) line.

5. A monitoring system according to Claim 1, wherein said data compressing means comprises a MODEM based on a V.42 bis specified by Comité Consultatif International Télégraphique et Téléphonique (CCITT).

6. A monitoring system according to Claim 1, wherein the public line comprises an optical network, and wherein said data compressing means comprises;

a MODEM based on a V.42 bis specified by CCITT, and

an optical adapter.

7. A monitoring system according to Claim 1, wherein said processing means comprises a MODEM based on a V.42 bis specified by CCITT.

8. A monitoring system according to Claim 1 further comprises:

remote control means; and

monitoring supplemental means, coupled to said remote control means via the public line, said remote control means remote-controlling said monitoring supplemental means so that an activity of the monitored object can be restricted.

9. A monitoring system according to Claim 8 wherein said monitoring supplemental means comprises lighting means including a plurality of lights for turning on/off some of the lights.

10. A monitoring system according to Claim 8, wherein said monitoring supplemental means comprises speaker means for transmitting a voice message to the monitored object.

11. A monitoring system substantially hereinbefore described with reference to FIGs.2A, 2B, 2C, 2D, 3, 4, 5, 6 and 7.

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Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

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(ii) Int Cl (Edition 5) H04N - 7/10, 7/18

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Databases (see over)

(i) UK Patent Office

(ii) ONLINE - DERWENT WPI

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Documents considered relevant following a search in respect of claims 1-11

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X,Y	GB 2064189 A ASCOTTS See whole document	1-11
Y	GB 1431051 A RCA See Figure 1	1-11
Y	EP 0010813 A1 VIDEOPHONE See lines 11-19 page 5	1-11
X,Y	US 5027104 A REID See whole document	1-11
Y	US 4814869 A OLIVER See lines 1-22 page 1	1-11
Y	US 4054910 A TEL-E-TEL See lines 1-29 page 1 and lines 5-13 page 3	1-11

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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